CLAIMS

1. A display (200) for producing a substantially seamless combined image on a screen (230) from at least first and second images, comprising:

at least first and second projectors (205, 210) for projecting corresponding first and second images separately onto a screen (230), said projectors projecting said first and second images such that a portion of said first image overlaps a portion of said second image so as to define at least one seam region (207) on said screen;

an image processor coupled to said first and second projectors for adjusting brightness of said first and second image portions such that said seam is substantially not visible to a viewer.

2. The display of claim 1 wherein said processor adjusts said first and second image portions according to a quadratic relationship.

3. The display of claim 2 wherein said quadratic relationship is described by the relationship:

$$x1 = \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)^{\frac{1}{gamma}} \quad x2 = \left(1 - \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)\right)^{\frac{1}{gamma}}$$

Wherein x1 represents a pixel from said first image portion after processing, x2 represents a pixel from said second image portion after processing, j represents the pixel number in the seam region corresponding to the location of overlapping pixels x1 and x2, overlap is the seaming area in number of pixels, and gamma is related to the gamma correction of the projector.

4. The display of claim 1 wherein said processor further adjusts said first and second images portions according to characteristics of said projectors.

5. The display of claim 4 wherein said characteristics are selected from the group comprising: projector brightness characteristics, projector lens uniformity, image transfer function characteristics, imager gamma, display gamma.

6. The display of claim 1 wherein said processor adjusts said brightness without relying on information provided by any screen image capture means.

7. The display of claim 1 wherein said processor further adjusts said first and second images so as to provide gamma correction for said first and second images, wherein said processor applies a first gamma correction to portions of said images within said seam region and a second gamma correction, different from said first gamma correction, to portions of said images outside said seam region.

8. The display of claim 1 wherein said processor adjusts said first image and second image portions such that said combined image is of substantially uniform brightness when displayed on said screen.

9. The display of claim 3 wherein said processor adjusts the brightness of said first and second image portions in an inverse relationship to each other.

10. The display of claim 6 wherein said inverse relationship is a linearly inverse relationship.

11. The display of claim 6 wherein said processor adjusts the brightness of said first and second image portions in accordance with the linearly inverse relationships:

$$x1 = \left(\left(\frac{j}{overlap}\right)\right)^{1/gamma} \qquad x2 = \left(\left(1 - \frac{j}{overlap}\right)\right)^{1/gamma}$$

Wherein x1 represents a pixel from said first image portion after processing, x2 represents a pixel from said second image portion after processing, j represents the pixel number in the seam region corresponding to the location of overlapping pixels x1 and x2, overlap is the seaming area in number of pixels, and gamma is related to the gamma correction of the projector.

12. The display of claim 6 wherein said inverse relationship is quadratic relationship.

13. The display of claim 9 wherein said quadratic relationship is described the relationship:

$$x1 = \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)^{\frac{1}{gamma}} \qquad x2 = \left(1 - \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)\right)^{\frac{1}{gamma}}$$

Wherein x1 represents a pixel from said first image portion after processing, x2 represents a pixel from said second image portion after processing, j represents the pixel number in the seam region corresponding to the location of overlapping pixels x1 and x2, overlap is the seaming area in number of pixels, and gamma is related to the gamma correction of the projector.

14. A method for producing a substantially seamless combined image on a screen (230) from at least first and second images, comprising:

providing at least first and second projectors (205, 210) for projecting corresponding first and second images separately onto a screen (230), said projectors projecting said first and second images such that at least a portion of said first image overlaps at least a portion of said second image so as to define at least one seam region (207) on said screen;

processing said first and second image portions so as to adjust at least one characteristic of said first and second image portions in accordance with corresponding characteristics of said projectors;

projecting said adjusted first and second image portions onto said screen.

15. The method of claim 11 wherein said characteristics of said projectors are selected from the group comprising: projector lens characteristics, image transfer function characteristics, display transfer function characteristics, imager gamma, display gamma.

16. The method of claim 11 wherein said adjustment is determined without relying on information provided by any screen image capture means.

17. The method of claim 11 further including a step of gamma correcting said displayed image by applying a first gamma correction to portions of said images within said seam region and a second gamma correction, different from said first gamma correction, to remaining portions of said displayed image.

18. The method of claim 11 including wherein said processing step is carried out such that said combined image is of substantially uniform brightness when displayed on said screen.

19. The method of claim 15 including a step of adjusting the brightness of said first and second image portions in an inverse relationship to each other.

20. The method of claim 14 wherein said inverse relationship is a linearly inverse relationship.

21. The method of claim 16 including a step of adjusting the brightness of said first and second image portions in accordance with the linearly inverse relationships:

$$x1 = \left(\left(\frac{j}{overlap}\right)\right)^{1/gamma} \qquad x2 = \left(\left(1 - \frac{j}{overlap}\right)\right)^{1/gamma}$$

Wherein x1 represents a pixel from said first image portion after processing, x2 represents a pixel from said second image portion after processing, j represents the pixel number in the seam region corresponding to the location of overlapping pixels x1 and x2, overlap is the seaming area in number of pixels, and gamma is related to the gamma correction of the projector.

22. The method of claim 16 wherein said inverse relationship is quadratic relationship.

23. The method of claim 19 wherein said quadratic relationship is described the relationship:

$$x1 = \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)^{\frac{1}{gamma}} \qquad x2 = \left(1 - \left(0.5 \times \cos ine\left(\frac{PI \times j}{overlap}\right) + .5\right)\right)^{\frac{1}{gamma}}$$

Wherein x1 represents a pixel from said first image portion after processing, z2 represents a pixel from said second image portion after processing, j represents the pixel number in the seam region corresponding to the location of overlapping pixels x1 and x2, overlap is the seaming area in number of pixels, and gamma is related to the gamma correction of the projector.